

WHAT IS CLAIMED IS:

1. A photo-semiconductor module comprising:

a circuit board;

5 a light-receiving photo-semiconductor device mounted on said circuit board in a flip-chip manner; and

an optical fiber fixed to a mounting face of said light-receiving photo-semiconductor device or a back face of said mounting face.

10 2. The photo-semiconductor module according to claim 1, wherein said light-receiving photo-semiconductor device has

a photo-absorbing layer, so that said optical fiber is fixed at a position opposite to said photo-absorbing layer along a 15 direction perpendicular to said mounting face.

3. The photo-semiconductor module according to claim 1, wherein said circuit board has a connection electrode, so

that an input/output terminal electrode of said light-

20 receiving photo-semiconductor device provided on said mounting face is connected to said connection electrode via a protruding electrode and a conductive adhesive agent.

4. The photo-semiconductor module according to claim 3, wherein surroundings of a connection between said

25 input/output terminal electrode and said connection electrode are encapsulated by an encapsulating resin.

5. The photo-semiconductor module according to claim 4, wherein an opposing portion between said light-receiving

30 photo-semiconductor device and said circuit board except said connection is encapsulated by said encapsulating resin.

6. The photo-semiconductor module according to claim 1, wherein said circuit board has a connection electrode, so that an input/output terminal electrode of said light-receiving photo-semiconductor device provided on said mounting face is connected to said connection electrode via solder.

7. The photo-semiconductor module according to claim 6, wherein surroundings of a connection between said input/output terminal electrode and said connection electrode are encapsulated by an encapsulating resin.

8. The photo-semiconductor module according to claim 7, wherein an opposing portion between said light-receiving photo-semiconductor device and said circuit board except said connection is encapsulated by said encapsulating resin.

9. The photo-semiconductor module according to claim 1, wherein said optical fiber is fixed to said back face using an adhesive resin.

10. The photo-semiconductor module according to claim 9, wherein said back face is provided with a mounting hole formed therein toward said mounting face, in which mounting hole is inserted and fixed said optical fiber.

11. The photo-semiconductor module according to claim 10, wherein said mounting hole has such a depth that extends to a vicinity of a photo-absorbing layer of said light-receiving photo-semiconductor device.

12. The photo-semiconductor module according to claim 1, wherein said light-receiving photo-semiconductor device is

provided on a compound semiconductor substrate having a Pin-photodiode.

13. The photo-semiconductor module according to claim 5 12, wherein said circuit board has a connection electrode, so that said connection electrode to be connected at least to either one of P-side and N-side electrodes of said Pin-photodiode is provided at such a site of said circuit board that is opposite to a periphery of said light-receiving photo-semiconductor device.

14. The photo-semiconductor module according to claim 9, further comprising an auxiliary mounting plate having a though-hole therein, so that said optical fiber is fixed to said light-receiving photo-semiconductor device by fixing said auxiliary mounting plate to said back face with said optical fiber as inserted and fixed in said through-hole.

15. The photo-semiconductor module according to claim 20 14, comprising an encapsulating resin which encapsulates surroundings of a connection between said input/output terminal electrode and said connection electrode, so that said encapsulating resin is used to fix said auxiliary mounting plate to said back face.

16. A method for manufacturing a photo-semiconductor module having a circuit board, a light-receiving photo-semiconductor device mounted flip-chip-wise on said circuit board, and an optical fiber fixed to a back face of a mounting face of said light-receiving photo-semiconductor device, comprising the steps of:

forming a protruding electrode to an input/output terminal electrode provided on said mounting face to then

supply a conductive adhesive agent to said protruding electrode;

installing said light-receiving photo-semiconductor device to said circuit board so that said input/output terminal electrode 5 may butt against a connection electrode provided on said circuit board;

hardening said conductive adhesive agent to thereby mount said light-receiving photo-semiconductor device to said circuit board;

10 encapsulating a connection site between said light-receiving photo-semiconductor device and said circuit board, using an encapsulating resin; and

fixing an optical fiber to said back face.

15 17. The method for mounting a photo-semiconductor module according to claim 16, wherein:

a photo-hardening resin is used as an adhesive agent to fix said optical fiber and said encapsulating resin; and said encapsulating resin and said adhesive agent are 20 photo-hardened simultaneously.

18. The method for manufacturing a photo-semiconductor module according to claim 16, wherein:

a compound semiconductor substrate having a Pin-photodiode 25 is used to make said light-receiving photo-semiconductor device; and

said protruding electrode is formed on said input/output terminal electrode with both short-side faces of said compound semiconductor substrate as sandwiched by a jig.

30 19. A method for manufacturing a photo-semiconductor module having a circuit board, a light-receiving photo-semiconductor device mounted flip-chip-wise on said circuit

board, and an optical fiber fixed to a back face of a mounting face of said light-receiving photo-semiconductor device, comprising the steps of:

supplying solder to a connection electrode provided on
5 said circuit board;

installing said light-receiving photo-semiconductor device to said circuit board so that said input/output terminal electrode may butt against said connection electrode provided on said mounting face;

10 melting said solder to thereby mount said light-receiving photo-semiconductor device to said circuit board;
15 encapsulating a connection site between said light-receiving photo-semiconductor device and said circuit board, using an encapsulating resin; and

fixing an optical fiber to said back face.

20. The method for mounting a photo-semiconductor module according to claim 19, wherein:

a photo-hardening resin is used as an adhesive agent
20 to fix said optical fiber and said encapsulating resin; and
said encapsulating resin and said adhesive agent are photo-hardened simultaneously.

25. The method for manufacturing a photo-semiconductor module according to claim 19, wherein heat and load are applied to said solder to thereby produce a diffused compound between said solder and said terminal electrode.